WHAT IS CLAIMED IS:

1. A picture recognition apparatus, comprising:

an object modeling execution part for estimating variations in appearance of an object caused by variations in a capturing environment and modeling the object;

an object model registering part for previously registering the object model obtained in the object modeling execution part in a database;

a picture information input part for inputting picture information of an object to be a recognition target;

a similarity determining part for matching the input picture information with the object model previously registered in the object model registering part, and determining a similarity with respect to the registered object model; and

an object recognizing part for outputting a type of the object to be a recognition target determined to be most similar among the registered object model,

wherein, in the object modeling execution part, information of a plurality of pictures captured by changing a relative position and posture of the object with respect to the fixed picture information input part is input, and variations in appearance of the object caused by possible variations in a capturing environment are estimated to be modeled based on the input information of a plurality of pictures.

2. A picture recognition apparatus according to claim 1, wherein a Lambertian reflection model is assumed as surface characteristics of the object to be a recognition target.

3. A picture recognition apparatus according to claim 1, wherein, in the picture information input part, a portion including the object to be a recognition target is cut out from a picture, and the object to be a recognition target is modeled using the cut out portion.

4. A picture recognition apparatus according to claim 1, wherein, in the picture information input part, a characteristic small region in the object to be a recognition target is selected from a picture, and the object to be a recognition target is modeled based on information included in the selected small region and arrangement information of the small region.

5. A picture recognition apparatus according to claim 1, wherein, in the object modeling execution part, variations in appearance caused by variations in a posture of the object and variations in appearance caused by variations in illumination conditions are separately modeled based on the input picture information.

6. A picture recognition apparatus according to claim 2, wherein, in the object modeling execution part, variations in appearance caused by variations in a posture of the object and variations in appearance caused by variations in illumination conditions are separately modeled based on the input picture information.

7. A picture recognition apparatus according to claim 3, wherein, in the object modeling execution part, variations in appearance caused by variations in a posture of the object and variations in appearance caused by variations in illumination conditions are separately modeled based on the input picture information.

8. A picture recognition apparatus according to claim 4, wherein, in the object modeling execution part, variations in appearance caused by variations in a posture of the object and variations in appearance caused by variations in illumination conditions are separately modeled based on the input picture information.

9. A picture recognition apparatus according to claim 1, wherein, in the object

modeling execution part, variations in appearance caused by variations in a posture of the object and variations in appearance caused by variations in illumination conditions are modeled together based on the input picture information.

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10. A picture recognition apparatus according to claim 2, wherein, in the object modeling execution part, variations in appearance caused by variations in a posture of the object and variations in appearance caused by variations in illumination conditions are modeled together based on the input picture

10 information.

11. A picture recognition apparatus according to claim 3, wherein, in the object modeling execution part, variations in appearance caused by variations in a posture of the object and variations in appearance caused by variations in

15 illumination conditions are modeled together based on the input picture information.

12. A picture recognition apparatus according to claim 4, wherein, in the object modeling execution part, variations in appearance caused by variations in a posture of the object and variations in appearance caused by variations in

20 illumination conditions are modeled together based on the input picture information.

13. A picture recognition method, comprising:

25   estimating variations in appearance caused by variations in a capturing environment and modeling the object;
        previously registering the obtained object model in a database;
        inputting picture information of an object to be a recognition target;
        matching the input picture information with the previously registered

30 object model to determine a similarity with respect to the registered object model; and
        outputting a type of the object to be a recognition target determined to

be most similar among the registered object models,

wherein information of a plurality of pictures captured by changing a relative position and posture of the object is input, and variations in appearance of the object caused by possible variations in a capturing

5   environment are estimated to be modeled based on the input information of a plurality of pictures.

14. A computer-readable recording medium storing a program to be executed by a computer, the program comprising:

10   estimating variations in appearance caused by variations in a capturing environment and modeling the object;

previously registering the obtained object model in a database;

inputting picture information of an object to be a recognition target;

matching the input picture information with the previously registered

15   object model to determine a similarity with respect to the registered object model; and

outputting a type of the object to be a recognition target determined to be most similar among the registered object models,

wherein information of a plurality of pictures captured by changing a

20   relative position and posture of the object is input, and variations in appearance of the object caused by possible variations in a capturing environment are estimated to be modeled based on the input information of a plurality of pictures.